

What is claimed is:

1. A method for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,  
5 wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,  
10 the method comprising the step of jetting a molten metal against the construction member to deposit the molten metal on a surface of the construction member to form the electric circuit on the construction member based on the data.  
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2. A method for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,  
20 wherein the data is associated with a reference

coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

5 the electric circuit extended between the two points,

the method comprising the step of jetting a molten electrically conductive plastic against the construction member to deposit the electrically conductive plastic on a surface of the construction member to form the electric circuit on the construction member based on the data.

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3. A method for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

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wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

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the method comprising the step of jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin against the construction member to deposit the electrically conductive plastic on a

surface of the construction member to form the electric circuit on the construction member based on the data.

4. A method for forming an electric circuit on a

construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

the method comprising the step of converting the data to a second set of data associated with a reference coordinate system provided in the construction member,

the method further comprising the step of jetting a molten metal against the construction member to deposit the molten metal on a surface of the construction member to form the electric circuit on the construction member based on the second set of data.

5. A method for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and

a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

5 wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of  
10 the electric circuit extended between the two points,

the method comprising the step of converting the data to a second set of data associated with a reference coordinate system provided in the construction member,

the method further comprising the step of jetting a molten electrically conductive plastic against the construction member to deposit the electrically conductive plastic on a surface of the construction member to form the electric circuit on the construction member based on the second set of data.

20        6. A method for forming an electric circuit on a  
construction member of a machine based on a set of three-  
dimensional data, the data used to determine a position and  
a profile of the construction member, a position of the  
electric circuit, and a shape of the electric circuit, the  
25        electric circuit used for electrical connection between  
electric instruments mounted on the construction member.

wherein the data is associated with a reference coordinate system provided in the machine, and the data

includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

5 the method comprising the step of converting the data to a second set of data associated with a reference coordinate system provided in the construction member,

10 the method comprising the step of jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin against the construction member to deposit the electrically conductive plastic on a surface of the construction member to form the electric circuit on the construction member based on the second set of data.

15 7. The method as described in claim 1 wherein an insulator is layered on the electric circuit.

20 8. The method as described in claim 7 wherein the method comprises the step of jetting a molten metal against the construction member to deposit the molten metal on the insulator.

25 9. The method as described in claim 7 wherein the method comprises the step of jetting a molten electrically conductive plastic against the construction member to deposit the electrically conductive plastic on the insulator.

10. The method as described in claim 7 wherein the method comprises the step of jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin, against the construction member to 5 deposit the electrically conductive paste on the insulator.

11. A method for forming an electric circuit on an insulating intermediate member laid on a construction member of a machine based on a set of three-dimensional data, the 10 data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

15 wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

20 the method comprising the step of jetting a molten metal against the construction member to deposit the molten metal on a surface of the insulating intermediate member to form the electric circuit on the insulating intermediate member 25 based on the data.

12. A method for forming an electric circuit on an insulating intermediate member laid on a construction member

of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

the method comprising the step of jetting a molten electrically conductive plastic against the insulating intermediate member to deposit the electrically conductive plastic on a surface of the insulating intermediate member to form the electric circuit on the surface of the insulating intermediate member based on the data.

13. A method for forming an electric circuit on an insulating intermediate member laid on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference

coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

5 the method comprising the step of jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin, against the insulating intermediate member to deposit the electrically conductive paste on a surface of the insulating intermediate member to form the electric circuit on the surface of the insulating intermediate member based on the data.

10 14. A method for forming an electric circuit on an insulating intermediate member laid on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

15 20 wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

25 the method comprising the step of converting the data to a

second set of data associated with a reference coordinate system provided in the construction member or on the intermediate member,

the method comprising the step of jetting a molten metal  
5 against the insulating intermediate member to deposit the molten metal on a surface of the insulating intermediate member to form the electric circuit on the surface of the insulating intermediate member based on the second set of data.

10 15. A method for forming an electric circuit on an insulating intermediate member laid on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

25 the method comprising the step of converting the data to a second set of data associated with a reference coordinate system provided in the construction member or on the intermediate member,

the method comprising the step of jetting to a molten electrically conductive plastic against the insulating intermediate member to deposit the molten metal on a surface of the insulating intermediate member to form the electric circuit on the surface of the insulating intermediate member based on the second set of data.

16. A method for forming an electric circuit on an insulating intermediate member laid on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the construction member,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit extended between the two points,

the method comprising the step of converting the data to a second set of data associated with a reference coordinate system provided in the construction member or on the intermediate member,

the method comprising the step of jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin, against the insulating

intermediate member to deposit the molten metal on a surface of the insulating intermediate member to form the electric circuit on the surface of the insulating intermediate member based on the second set of data.

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17. The method as described in claim 11 wherein an insulator is layered on the electric circuit defined on the insulating intermediate member.

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18. The method as described in claim 17 wherein the method comprises the step of jetting a molten metal against the insulator to deposit the molten metal on the insulator.

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19. The method as described in claim 17 wherein the method comprises the step of jetting a molten electrically conductive plastic against the insulator to deposit the electrically conductive plastic on the insulator.

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20. The method as described in claim 17 wherein the method comprises the step of jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin, against the insulator to deposit the electrically conductive plastic on the insulator.

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21. An apparatus for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the

electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a jet means for jetting a molten metal, a first transfer means for moving the construction member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the construction member and the jet means based on the data,

whereby the jet means can jet the molten metal against the construction member so that the molten metal can be deposited on a surface of the construction member to form the electric circuit on the construction member.

22. An apparatus for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the 5 points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a jet means for jetting a molten electrically conductive plastic, a first transfer means for moving the construction member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the construction member and the jet means based on the data,

15 whereby the jet means can jet the molten metal against the construction member so that the molten electrically conductive plastic can be deposited on a surface of the construction member to form the electric circuit on the construction member.

20 23. An apparatus for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

wherein the data is associated with a reference

coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of 5 the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a jet means for jetting an electrically conductive paste which includes a metal, a resin, and a solution for 10 dissolving the resin, a first transfer means for moving the construction member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the construction member and the jet means based on the data,

15 whereby the jet means can jet the molten metal against the construction member so that the electrically conductive paste can be deposited on a surface of the construction member to form the electric circuit on the construction member.

20 24. An apparatus for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the 25 electric circuit used for electrical connection between electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data

includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the 5 distances,

the apparatus comprising a storage means for storing the data, a data converter means for converting the data to a second set of data associated with a reference coordinate system provided in the construction member, a jet means for jetting a molten metal, a first transfer means for moving the construction member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the construction member and the jet means based on the second set of data,

15 whereby the jet means can jet the molten metal against the construction member so that the molten metal can be deposited on a surface of the construction member to form the electric circuit on the construction member.

20 25. An apparatus for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between 25 electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data

includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the 5 distances,

the apparatus comprising a storage means for storing the data, a data converter means for converting the data to a second set of data associated with a reference coordinate system provided in the construction member, a jet means for jetting a molten electrically conductive plastic, a first transfer means for moving the construction member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the construction member and the jet means based on the second set 10 of data,

whereby the jet means can jet the molten electrically conductive plastic against the construction member so that the molten electrically conductive plastic can be deposited on a surface of the construction member to form the electric 15 circuit on the construction member.

20 26. An apparatus for forming an electric circuit on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between 25 electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the 5 points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a data converter means for converting the data to a second set of data associated with a reference coordinate system provided in the construction member, a jet means for jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin, a first transfer means for moving the construction member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the construction member and the jet means based on the second set of data,

whereby the jet means can jet the electrically conductive paste against the construction member so that the electrically conductive paste can be deposited on a surface of the construction member to form the electric circuit on the construction member.

25. 27. The apparatus as described in claim 21 further comprising an insulator jetting means for jetting a molten insulating material and a second transfer means moving the insulator jetting means relative to the

construction member, wherein the control means makes at least one of the first and second transfer means move the insulator jetting means to jet the molten insulating material against the electric circuit positioned on a surface 5 of the construction member so as to layer the insulating material on the electric circuit.

28. The apparatus as described in claim 21 further comprising an insulator jetting means for jetting an insulating paste which includes an insulating resin and a solution for dissolving the resin, and a second transfer means moving the insulator jetting means relative to the construction member, wherein the control means makes at least one of the first and second transfer means move the insulator jetting means to jet the insulating paste against the electric circuit positioned on a surface of the construction member so as to layer the insulating paste on the electric circuit.

29. The apparatus as described in claim 22 further comprising an insulator jetting means for jetting a molten insulating material and a second transfer means moving the insulator jetting means relative to the construction member, wherein the control means makes at least one of the first and second transfer means move the insulator jetting means to jet the molten insulating material against the electric circuit positioned on a surface 25 of the construction member so as to layer the insulating

material on the electric circuit.

30. The apparatus as described in claim 22 further comprising an insulator jetting means for jetting an insulating paste which includes an insulating resin and a solution for dissolving the resin, and a second transfer means moving the insulator jetting means relative to the construction member, wherein the control means makes at least one of the first and second transfer means and the second transfer means move the insulator jetting means to jet the insulating paste against the electric circuit positioned on a surface of the construction member so as to layer the insulating paste on the electric circuit.

15 31. The apparatus as described in claim 23 further comprising an insulator jetting means for jetting a molten insulating material and a second transfer means moving the insulator jetting means relative to the construction member, wherein the control means makes at least one of the first and second transfer means and the second transfer means move the insulator jetting means to jet the molten insulating material against the electric circuit positioned on a surface of the construction member so as to layer the insulating material on the electric circuit.

20 25 32. The apparatus as described in claim 23 further comprising an insulator jetting means for jetting an

insulating paste which includes an insulating resin and a solution for dissolving the resin and a second transfer means moving the insulator jetting means relative to the construction member, wherein the control means makes at least 5 one of the first and second transfer means and the second transfer means move the insulator jetting means to jet the insulating paste against the electric circuit positioned on a surface of the construction member so as to layer the insulating paste on the electric circuit.

10 33. The apparatus as described in claim 27 wherein the control means makes the first transfer means move the jetting means relative to the construction member to jet the molten metal so as to layer the molten metal on the insulator.

15 34. The apparatus as described in claim 29 wherein the control means makes the one of first and second transfer means move the jet means relative to the construction member to jet the a molten electrically conductive plastic so as to layer the electrically conductive plastic on the insulating material.

20 35. The apparatus as described in claim 31 wherein the control means makes the one of first and second transfer means move the jet means relative to the construction member to jet the an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin so

as to layer the electrically conductive paste on the insulating material.

36. An apparatus for forming an electric circuit on an insulating intermediate member layered on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a jet means for jetting a molten metal, a first transfer means for moving the intermediate member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the intermediate member and the jet means based on the data, whereby the jet means can jet the molten metal against the intermediate member so that the molten metal can be deposited on a surface of the intermediate member to form the electric circuit on the intermediate member.

37. An apparatus for forming an electric circuit on an insulating intermediate member layered on a construction member of a machine based on a set of three-dimensional data,  
5 the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

10 wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of  
15 the electric circuit associated with each of the distances,

20 the apparatus comprising a storage means for storing the data, a jet means for jetting a molten electrically conductive plastic, a first transfer means for moving the intermediate member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the intermediate member and the jet means based on the data,

25 whereby the jet means can jet the molten metal against the intermediate member so that the molten electrically conductive plastic can be deposited on a surface of the intermediate member to form the electric circuit on the intermediate member.

38. An apparatus for forming an electric circuit on an insulating intermediate member layered on a construction member of a machine based on a set of three-dimensional data, 5 the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

10 wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of 15 the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a jet means for jetting an electrically conductive paste which includes a metal, a resin, and a solution for 20 dissolving the resin, a first transfer means for moving the intermediate member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the intermediate member and the jet means based on the data,

25 whereby the jet means can jet the molten metal against the intermediate member so that the electrically conductive paste can be deposited on a surface of the intermediate member to form the electric circuit on the intermediate member.

39. An apparatus for forming an electric circuit on an insulating intermediate member layered on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

10 wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of 15 the electric circuit associated with each of the distances,

20 the apparatus comprising a storage means for storing the data, a data converter means for converting the data to a second set of data associated with a reference coordinate system provided in the construction member, a jet means for jetting a molten metal, a first transfer means for moving the intermediate member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the intermediate member and 25 the jet means based on the second set of data,

whereby the jet means can jet the molten metal against the intermediate member so that the molten metal can be deposited on a surface of the intermediate member to form

the electric circuit on the intermediate member.

40. An apparatus for forming an electric circuit on an insulating intermediate member layered on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a data converter means for converting the data to a second set of data associated with a reference coordinate system provided in the construction member, a jet means for jetting a molten electrically conductive plastic, a first transfer means for moving the intermediate member relative to the jet means, and a control means for controlling the jet means and for controlling the relative movement between the intermediate member and the jet means based on the second set of data,

whereby the jet means can jet the molten electrically

conductive plastic against the intermediate member so that the molten electrically conductive plastic can be deposited on a surface of the intermediate member to form the electric circuit on the intermediate member.

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41. An apparatus for forming an electric circuit on an insulating intermediate member layered on a construction member of a machine based on a set of three-dimensional data, the data used to determine a position and a profile of the construction member, a position of the electric circuit, and a shape of the electric circuit, the electric circuit used for electrical connection between electric instruments mounted on the machine,

wherein the data is associated with a reference coordinate system provided in the machine, and the data includes coordinates of points for determining arrangement of the electric circuit, a distance between any two of the points adjacent to each other, and a cross-sectional area of the electric circuit associated with each of the distances,

the apparatus comprising a storage means for storing the data, a data converter means for converting the data to a second set of data associated with a reference coordinate system provided in the construction member, a jet means for jetting an electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin, a first transfer means for moving the intermediate member relative to the jet means, and a control means for

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controlling the jet means and for controlling the relative movement between the intermediate member and the jet means based on the second set of data,

5 whereby the jet means can jet the electrically conductive paste against intermediate member so that the electrically conductive paste can be deposited on a surface of intermediate member to form the electric circuit on intermediate member.

10 42. The apparatus as described in claim 36 further comprising an insulator jetting means for jetting a molten insulating material and a second transfer means moving the insulator jetting means relative to the intermediate member, wherein the control means makes at least one of the first and second transfer means move the insulator jetting means to jet the molten insulating material against the electric circuit positioned on a surface of the intermediate member so as to layer the insulating material on the electric circuit.

20 25 43. The apparatus as described in claim 36 further comprising an insulator jetting means for jetting an insulating paste which includes an insulating resin and a solution for dissolving the resin and a second transfer means moving the insulator jetting means relative to the intermediate member, wherein the control means makes at least one of the first and second transfer means move the insulator jetting means to jet the insulating paste against the

electric circuit positioned on a surface of the intermediate member so as to layer the an insulating paste on the electric circuit.

5       44. The apparatus as described in claim 37 further comprising an insulator jetting means for jetting a molten insulating material and a second transfer means moving the insulator jetting means relative to the intermediate member, wherein the control means makes at least one of the first and second transfer means move the insulator jetting means to jet the molten insulating material against the electric circuit positioned on a surface of the intermediate member so as to layer the insulating material on the electric circuit.

10       15       45. The apparatus as described in claim 37 further comprising an insulator jetting means for jetting an insulating paste which includes an insulating resin and a solution for dissolving the resin and a second transfer means moving the insulator jetting means relative to the intermediate member, wherein the control means makes at least one of the first and second transfer means move the insulator jetting means to jet the insulating paste against the electric circuit positioned on a surface of the intermediate member so as to layer the insulating paste on the electric circuit.

20       25       46. The apparatus as described in claim 38 further

comprising an insulator jetting means for jetting a molten insulating material and a second transfer means moving the insulator jetting means relative to the intermediate member, wherein the control means makes at least 5 one of the first and second transfer means move the insulator jetting means to jet the molten insulating material against the electric circuit positioned on a surface of the intermediate member so as to layer the insulating material on the electric circuit.

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47. The apparatus as described in claim 38 further comprising an insulator jetting means for jetting an insulating paste which includes an insulating resin and a solution for dissolving the resin and a second transfer means moving the insulator jetting means relative to the intermediate member, wherein the control means makes at least 15 one of the first and second transfer means move the insulator jetting means to jet the insulating paste against the electric circuit positioned on a surface of the intermediate member so as to layer the insulating paste 20 on the electric circuit.

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48. The apparatus as described in claim 42 wherein the control means makes the one of first and second transfer means move the insulator jetting means relative to the intermediate member to jet the molten metal so as to 25 layer the molten metal on the insulating material.

49. The apparatus as described in claim 44 wherein the control means makes the one of first and second transfer means move the insulator jetting means relative to the intermediate member with jetting the molten electrically conductive plastic so as to layer the electrically conductive plastic on the insulating material.

50. The apparatus as described in claim 46 wherein the control means makes the one of first and second transfer means move the jet means relative to the intermediate member to jet the electrically conductive paste which includes a metal, a resin, and a solution for dissolving the resin so as to layer the electrically conductive paste on the insulating material.

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